

REMARKS/ARGUMENTS

The claims have not been changed from the previous response.

The Examiner rejected claim 4 under 35 U.S.C. 102(e), as being anticipated by Ye et al. (US Patent No. 6,080,529). The Examiner argued in paragraph 2 of paper 14 that a hydrogen/nitrogen-based plasma inherently provides an etch, where the etch selectivity of the materials is such that layer 222 (the mask patterning layer) etches more rapidly than layer 220 (the low k dielectric layer). The Examiner also argued in paragraph 10 of paper 14 that the etch selectivity of the materials is such that layer 222 etches more rapidly than layer 220.

Claim 4 claims a step of generating a plasma from the NH₃, which selectively etches the organic dielectric layer with respect to the hardmask. The phrase "selectively etches the organic dielectric layer with respect to the hardmask" indicates that the organic dielectric layer etches faster than the hardmask, which results in the organic dielectric layer being etched rather than the hardmask. As stated by the Examiner and as stated in col. 12, lines 60-62, of Ye et al., the etch taught in Ye et al. selectively etches the hardmask with respect to the organic dielectric, instead of selectively etching the organic dielectric layer with respect to the hardmask, as recited in claim 4. For at least these reasons, claim 4 is not anticipated by Ye et al.

The Examiner rejected claims 4, 11, 13, 20, 22, 25, 26, 33, and 34 under 35 U.S.C. 102(e), as being anticipated by Kadomura et al. (US Patent No. 6,352,937). Claims 4 and 13 recite generating a plasma from the NH₃, which selectively etches the organic dielectric layer, and simultaneously stripping the photoresist layer during the etching of the organic dielectric layer. Kadomura does not teach etching the organic dielectric layer with the plasma from the NH₃. The Examiner states that since Kadomura teaches the same method of etching different materials in the same structure using the same etchant (ammonia) as claimed in the invention, Kadomura's plasma from the ammonia inherently selectively etches the organic dielectric layer with respect to the hardmask. Col. 3, lines 56-64, of Kadomura teaches etching a contact hole 5 to expose the interconnect film 1, as shown in FIG. 2, before the ammonia plasma is used. Since the etching is completed, the applicant does not understand where further etching of the organic dielectric layer will occur during the stripping process taught in

Kadomura. Kadomura does not inherently etch the organic dielectric layer during the stripping process, since Kadomura does a complete etch before the stripping. For at least these reasons, claims 4 and 13 are not anticipated by Kadomura.

The Examiner rejected claim 5 under 35 U.S.C. 103(a), as being unpatentable over Kadomura et al. in view of Ding et al. (US 5,814,563). The Examiner rejected claims 7-9 under 35 U.S.C. 103(a), as being unpatentable over Kadomura et al. in view of Ding et al. (US 5,814,563) and further in view of Ye et al. (US 6,080,529). The Examiner rejected claims 21, 24 under 35 U.S.C. 103(a), as being unpatentable over Kadomura et al. in view of Guinn et al. (US 5,877,032).

Claim 24 recites generating a plasma from the NH₃, which etches the organic dielectric layer. As discussed above regarding claims 4 and 13, Kadomura et al. does not disclose or suggest etching the organic dielectric layer using a plasma from NH₃. Neither Kadomura et al. nor Guinn et al. teach or suggest etching an organic dielectric layer using a plasma from NH₃. For at least these reasons, claim 24 is not made obvious by Kadomura et al. in view of Guinn et al.

Claims 5, 7-9, 11, 20-22, 25-26, and 33-34 each depend either directly or indirectly from the independent claims, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to independent claims. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record.

For example, claim 5 further recites providing CH₃F while providing the etchant gas comprising NH₃. The Examiner cites col. 10, lines 26-27, of Ding as teaching this. Col. 10, lines 20-27, of Ding states that this etchant combination is for etching silicon dioxide. As discussed above, Kadomura does not teach using NH₃ or CH₃F for etching an organic dielectric layer. So it would not be obvious to combine the etch chemistry of Ding with the process of Kadomura to selectively etch an organic dielectric layer with respect to a hardmask. Therefore these cited references in combination do not provide a fast etch of the organic dielectric layer that has a high selectivity with respect to the hardmask layer. For at least these reasons, claims 5, 7-9, 11, 20-22, 25-26, and 33-34 are not made obvious by the cited references.

The Examiner objected to claims 27-32, stating that they would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. The applicants appreciate the Examiner's comments. Claims 27-32 will be amended at a later time, if needed.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (831) 655-2300.

Respectfully submitted,
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